"Structure Follows Process": Experiences with New Ways of Working and Communication Processes in Organizations

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Abstract. New information and communication technologies enable new ways of cooperation and communication in organizations. However, technologies do not determine their use by themselves. Their integration in companies' structures and operations seems to be a complex task. Moreover, a transition from hierarchy to networks implies the integration of employees in different parts of a company. Therefore successful communication needs agreements about a good communication culture. Shared rules and values (e.g. openness, politeness) communicated within accepted channels enhance an integration of employees and enforce the inclusion of external business partners (e.g. suppliers, customers).

Keywords. Communication culture, Social networks, Technology, Organizational change.

1. Introduction

The impact of new communication technologies on organizational changes and new work concepts (e.g. virtual structures) are often discussed controversially. Concepts like virtual or modular enterprises, based on the economical potentials of new media, are conceptualized in theory and practice. The interrelation of emerging new structures and motivation to engage in changing workplaces has not been considered as important. Phenomena like a decrease of social contacts or an information overload are often considered only as dysfunctional effects. Our findings indicate that social consequences (e.g. decrease of hierarchical barriers, self-organization, self-responsibility) are interrelated to organizational (e.g. management of change), technological (e.g. infrastructure, implementation) and personal dimensions (e.g. experience with media use, gender, position).

The outlined aspects are elaborated in two ongoing scientific projects at the University of Trier. In both studies data collection has been finished in spring 2004 (for further details see www.ceb-trier.de/spirit and www.uni-trier.de/~comm). The project "SPIRIT" is merely concerned with nine case studies in Germany and the United States (Silicon Valley/California). About 290 employees, executives and works councils filled out a standardized questionnaire within this study. Furthermore explorative interviews have been conducted. This research is funded by the German Federal Ministry for Education and Research (BMBF) till June 2004. The second project (Trier communication study) is based on quantitative surveys in more than twenty German organizations (n = 870 employees). This research is supported by the Foundation Rhineland-Palatinate for Innovation till June 2003. The results provide relevant information about the current use of new technologies and the challenge of implementing new organizational structures.

2. Technologies and Redefining Organizational Structures

Technologies do not determine their use by themselves (Orlikowski, 1992). Interconnectedness - the integration of technologies in companies' structures and operations - is a complex task. Both, structure and technology are embedded in dynamic processes. Changes in organizational structures and the use of technologies are influenced by human factors (e.g. media skills, qualification) as well as social and organizational factors. Giddens postulated the duality of structures and technologies. „[...] by the duality of structure I mean that the structural property of social systems are both the medium and the outcome practices that constitute those systems." (Giddens, 1979: 69) Therefore the speed of organizational change is driven by the acceptance of users as well as the working environment (e.g. organizational climate/culture, see 5. values as a key factor for a corporate communication culture).

Our findings suggest that the organization of communication (e.g. high amount of communication by electronic systems) correlates with users' experience. For example, during an ongoing use of new computer-based communication technologies employees seem to learn and elaborate strategies to prevent an information overload. For that reason personal factors influence employees' media use and their decisions. Early adopters of private e-mail or internet have learned from their experience and take media use for granted. Because there are also late adopters the use of new information and communication technologies in companies reflects different skills (see Figure 1).

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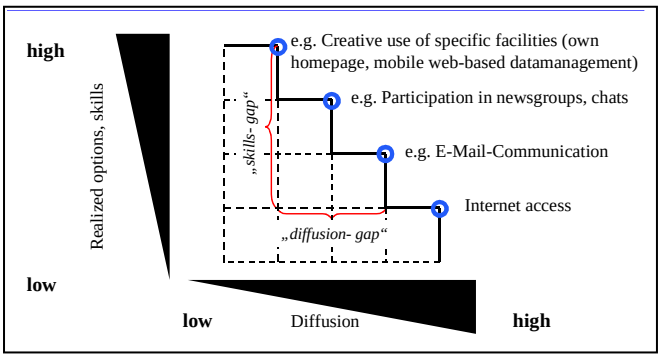

Figure 1. The Internet and Communication Skills: A graduating model

This leads to "digital divides" within enterprises causing less productivity and higher transaction costs. Furthermore technical access is of significance. "[...] unrestricted communication produces noise in the system. Without patterning, without pauses, without precision, there is sound but no music. Without structure, without spacing, without specifications, there is a Babel of tongues but no meaning." (Katz and Kahn, 1966: 226) Modern technologies play a key role in organizing work. Nevertheless employees, technology and the socio-economic context should be considered as constantly interacting units. Concepts of social integration are needed to prevent exclusion. In 1977 Beard already stated: „The success of an organization is determined by how well its members perform, and the success of organizational communication is a function of how effectively organizational members communicate. The ways in which individuals receive, interpret, and transmit messages and the ways in which those messages affect the individuals' motivations are therefore the factors central to organizational communication." (Baird, 1977: 33) This seems still to be true in the digital age.

3. Empirical Results: Work and Communication in Electronically based Environments

3.1. Flattening the pyramids = More self-control and opportunism

First results of SPIRIT research indicate that market orientated objectives are central for implementing so called e-business projects in Germany. For example, speed-up business processes, integration of customers demands and lower costs or better competitiveness are expected. The industrial work organization seems to imply inflexibility (e.g. span of control, long decision processes). Therefore companies make use of internal project teams or special task forces and try to reduce the hierarchical division of labor. For this Webers' (1864-1920) (Weber, 1976) bureaucratic and "rational" way of organizing decisions competes more and more against the approach of new, flexible team structures in administrative operations. In view of that the majority of senior or middle management (62%) attains explicitly the goal of promoting team-work while integrating new technologies. According to own statements 54% did not achieve this strategic objective so far. Consequently one might ask the legitimate and provocative question (with reference to Womack, 1990): Is dynamic team-work "the heart of a lean" company?

Figure 2 illustrates findings concerning experience with team and project work. The answers were collected on the basis of a six-point scale (1=strongly disagree up to 6=strongly agree). For example, the majority (53%) of employees participating in teams partly or strongly stated longer times to reach common decisions. Answers vary with the number of members involved in team-work activities. Especially those who usually work together with eight or more employees agreed to this item (average: 3,75). In contrast workers with less number of colleagues more frequent denied this statement (average: 2,93).

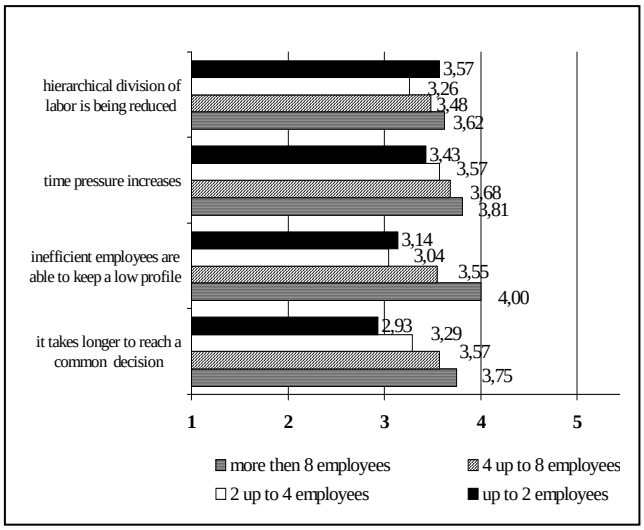

Figure 2. Experience with team and project work (mean value, SPIRIT project)

The results of this study indicate also new kinds of freerider-problems or of bystander-phenomena like diffusion of responsibility while distributing management functions among team members. Furthermore undefined responsibilities (e.g. fixing deadlines, authority as a spokesman), problems in documenting work progress (e.g. saving of different versions, formalization of procedures) or a decline of motivation in case of higher-educated staff might also lead to "anti-tayloristic" team-structures. That is the reason why the ideal of more autonomy in companies' decision processes and new concepts of employees' participation sometimes seem to be valued as an unpracticable or less attractive alternative, especially by members in leading positions. Or in the words of a young Vice President of a Start-Up-Company in the Silicon Valley who has been interviewed within the SPIRIT project: "A company cannot be run as a democracy."

3.2. Communication: overload or higher quality?

In 1966, Katz and Kahn already stated: "the discovery of the crucial role of communication led to an enthusiastic advocacy of increased information as the solution to many organizational problems. More and better communication (especially more) was the slogan." (Katz and Kahn, 1966: 224-225) Even in the discussion of new computer-based communication technologies the primary focus is often put on

better information-flow and increase of quantity of information. In this context the so called "information overload" is often seen as a consequence of new media. Rogers and Agarwala-Rogers described this phenomenon as "the state of an individual or a system in which excessive communication inputs cannot be processed and utilized, leading to breakdown." (Rogers and Agarwala-Rogers, 1976: 90) When analyzing the impact of digitalization on organizational communication the focus should not only be put on the quantitative part for information resources but also on a qualitative dimension.

A participant of the Trier communication study described the consequences of computer-mediated communication technologies as follows: "New media leads to more communication but not to more communication." It sounds like the statement that an increase of communication is not corresponding with a progression in (new) information. A possible consequence of this mismatch is a higher degree of redundancy in communication. This causes stress- and overload-phenomena for employees. The quality of communication is not only a matter of the quantity of information. It depends furthermore on the social perception of users.

The decrease of social contacts is often assumed as an impact of computer-mediated communication. Even the results of the Trier communication study show that employees perceive descending social contacts in daily work as a consequence of computer-mediated communication. The estimations of respondents, however, are strongly correlated to their experience with new media. Employees with an e-mail experience of more than eight years describe the changes in social contacts less dramatic than those with short experience. Furthermore, the results of the study indicate that especially the use of new communication media has a great influence on the use and perception of different communication modes. For example, the employees in administration using e-mail more than eight years consider the electronic mail as their preferred communication channel (telephone and face-to-face are ranked lower). The results for the advanced users in companies are comparable. If the perception of communication channels (e.g. face-to-face, email) is heterogeneous in organizations, communication quality cannot be seen exclusively as a technological matter (Jäckel and Würfel, 2004).

In our study of electronic communication the participants were asked to evaluate factors influencing communication quality. Figure 3 summarizes factors with the highest importance for employees.

In addition to economic factors (e.g. faster response, quantity of available information) socio-cultural and structural factors affect the perceived quality of organizational communication. Referring to the results of the Hawthorne study (Roethlisberger and Dickson, 1939), the high rated influence of communication with colleagues should have been no surprise. The different judgements for consistent communication with superiors in administration and companies can be explained by different influences of formal rules for daily work. Whereas the daily work in administration can be seen as relatively high regulated, everyday business in companies can be characterized by a higher degree of flexibility.

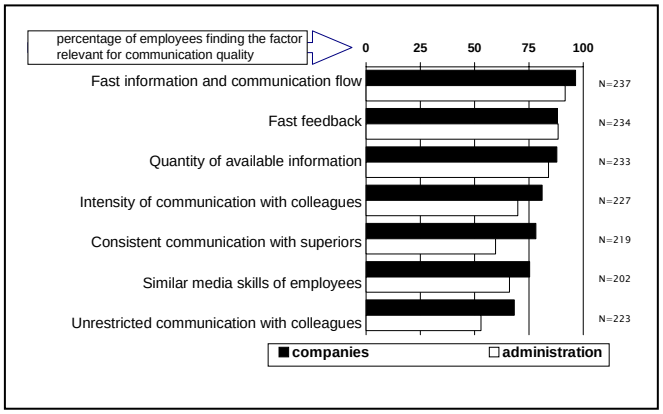

Figure 3. Factors influencing communication quality (in percent, Trier communication study)

Surprisingly the quantity of received information is substantially lower rated than the availability of information. Only about two-thirds of employees judge the quantity of received information as very important or important for the quality of communication. Moreover, users seem to develop behavior patterns that reduce overload phenomena. Therefore "information-pull"-strategies are preferred and find a higher acceptance than "information-push"-policies. With regard to a high redundancy in the field of many-to-many-communication, this could also be interpreted as a requirement for reliable and trustworthy information.

4. Hierarchy, Network, Net of Networks

Already Chester Barnard outlined the importance of communication in organizations when he stated: "The first executive function is to develop and maintain a system of communication" (Barnard, 1938: 226). His descriptions of efficient communication structures focused on defined structures and formal rules. Similar ideas are outlined in Max Webers' concept of bureaucracy. The dysfunctional aspects of such rigid and highly regulated structures are well known. However, Barnards' and Webers' elaborations are based on the thesis that organizational communication has to guarantee transparency and low redundancy. Today's organization charts often seem to contradict these objectives. Social networks compete with hierarchical structures and should increase organizational efficiency. "The value of a network goes up as the square of the numbers of users." (Shapiro and Varian, 1999: 184) In contrast to linear cost progression the exponential growth of network value is often promoted as a major benefit of network oriented organizational structures. The advantage of direct connections in organizations has already been outlined by Fayol ('Fayol's bridge'). But the assumption that each new connection adds additional (constant) value to the network is controversial. In case of reaching a certain size a process of diminishing marginal utility starts. For example, an increasing size of a (work-) group implies more heterogeneity. This will complicate the finding of agreements. The formation of opinion is a result of

compromises and could threaten the involvement and the motivation of the members of a large network. In situations of simultaneous communication, Hellriegel et al. consider the maximum personnel size of a workgroup no more than 12 members (Hellriegel et al., 1983). Furthermore increasing costs of dysfunctional effects (e.g. decreasing transparency, increasing redundancy) have to be taken into account. For this, a reflection of costs and value of networks is essential. The relative value of a network cannot grow exponential and the total costs are not following a linear function.

In this context Vester outlined an analogy between social networks and the growth of natural environments. Both can be characterized by high activity and a decreasing degree of stability (Vester, 2002). Small and highly networked groups can work flexible and ensure efficient solutions (e.g. information retrieval). Areas of responsibility are often alternating and seldom bound to individuals. Theories of motivation discuss these working opportunities in the context of so-called "job enlargement" or "job enrichment" concepts. A high amount of communication generates group stability and cohesion of members. When the number of members exceeds a critical size the efficiency of the system is weakened. For example, the exponential growth of connections in digital teams provokes free-rider-phenomena or information overload. Furthermore, the transparency of responsibilities (e.g. tasks, leadership) will decrease and the redundancy of communication will emerge as well.

To ensure efficient work it seems to be necessary to limit the size of networks. Personal responsibilities have to be defined, members should have transparency of communicational relationships or authorities. In order to benefit from highly interconnected networks, enterprises may form a net of networks (see Figure 4). In this form of coordination it is likely to be possible to reach a synthesis of team orientated flexibility and formal responsibilities. A division of labor is preferred to be organized within highly interconnected nets. To focus on special members can lead to reduced costs of transaction with the environment. They have a "bridging function" and are responsible for more complex coordination tasks. They can be regarded as the hierarchical element in the idea of a net of networks. Furthermore, these persons and the "free" employees (as shown in Figure 4), are responsible for the openness of the (work-) groups. This interconnectedness with the social environment of the "sub-network" can prevent the separation of groups ("groupthink tendencies") (see for a definition e.g. Janis, 1972 or Huseman and Driver, 1979). Already Granovetter pointed out the importance of so-called "weak ties" (Granovetter, 1973). He defined such relationships as interpersonal connections between individuals of different networks. The integration in various 'worlds' ensures innovativeness and flexibility for groups and organizations. This principle is getting important particularly in processes of organizational change (Fukuyama, 2002).

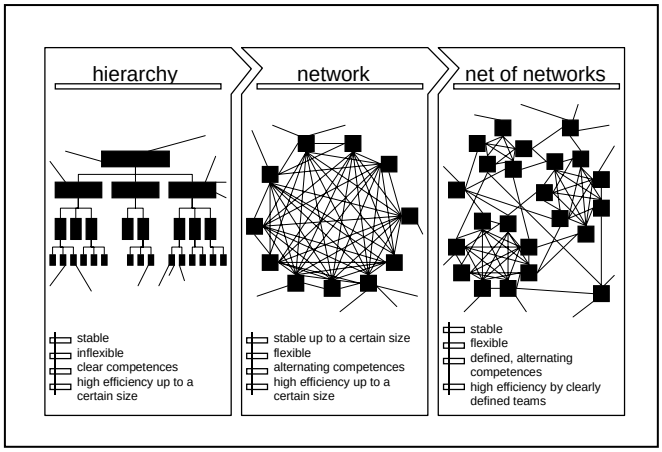

Figure 4. Hierarchy, network, and net of networks

When digitalization of computer-based information and communication technologies establishes new working opportunities and enforces the redesign of organizational structures, new ways of integration have to be found, which will be very important to the sustainable development of a company.

Currently the definition and classification of processes in enterprises is a frequently discussed theme. Considering a company from a process orientated view is assumed to be the key to build a competitive organization. Defined processes and compatible interfaces are crucial elements for very (inter-) active networks. As a consequence, outsourcing or "make-or-buy" decisions make up an increasing relevance in organizational strategies. If digital highways allow a global production, geographical boundaries and temporal and spatial restrictions shall become more and more obsolete. The empirical results illustrate that especially in the field of e-business one might state: Structure follows process.

5. Solving the Integration Problem: Values as a Key Factor for a Corporate Communication Culture

A higher degree of flexibility and decentralization in processes also necessitates new forms of integration, coordination and interconnectedness. Littmann and Jansen described this problem as the organizational dilemma between flexibility and stability (Littmann and Jansen, 2000).

In order to solve this integration problem, Thayers' well known position in organization science has to be remembered: "to speak of organization is to speak of communication". There is a need for concepts of social integration to prevent processes of exclusion. An integrated communication network ensures that a dislocated company will run efficiently. On the one hand new communication technologies enable any-time, any-place work concepts. On the other hand they play a key role with respect to the integration of employees, suppliers, consumers etc.. Communication barriers are either within individuals (e.g. value judgments, frame of reference), or within organizations respectively departments (e.g. in-group language, professional background). (Gibson et al., 1977) Because of this, a merely economically orientated view with focus on the formal communication will be insufficient.

Computer-based communication should also support the "grapevine", defined as the flow of informal (organizational) communication. In this context newspaper reports concerning restrictions of informal or general e-mail communication have to be looked upon critically. Nobody would like to forbid informal talks "in the corridor" or at the phone. And even if it had a positive effect on work (e.g. less interruptions), nobody would discuss, for example, "telephone free times" for the employees. The results of the Trier communication study indicate that the status of the so called "new media" is already changing. Last but not least, the ongoing diffusion of computer-mediated communication in households enforces a more and more habitualized use of these technologies.

Unrestricted communication and the intensity of contacts between employees (and superiors) have a high relevance for the perceived communication quality. But the in- and outgroup (intra- and internetwork) communication will show different degrees of intensity. Particularly for large or global enterprises, the integration of all units via communication is unrealistic. For example, large companies are often faced with a high degree of heterogeneity (e.g. speech, ethnic groups, sex, age). Furthermore, the internal competition between different units and workgroups may lead to information asymmetries. Creating conditions ensuring a companywide communication flow can be regarded as a challenge for companies with spatially separated units. The importance of interpersonal skills in organizational communication was already outlined by Sanford et al.. They point out four types of message-receiving-skills: "(1) listening for recall, (2) listening for understanding, (3) perception, and (4) group awareness." (Sanford et al., 1976: 249)

If communication plays a key-role in the integration of several business-units, the firm as a whole has to incorporate different ways of communication. Variety has to be managed. The Hawthorne study indicates the relevance of group and communication processes for motivation and daily work. Such processes bring off shared group norms and values. Even in media-choice theories for organizational communication value-based concepts are often discussed (e.g. Höflich, 1996).

New companywide rules of communication can only emerge when a homogeneous perception is given. In our projects, employees in lower hierarchical positions often had longer experience with e-mail than those in higher positions. Moreover the management perceives new media less important for daily work. Strategies for the reintegration of all employees, like concepts of organizational culture and climate, often do not confirm with shared rules, social conventions and norms (e.g. openness). These ideas are discussed as artificial, strategic and easy to influence by the management. A value based integration, however, has to include the working conditions concerning the employees and cannot only be expressed in corporate identity concepts. In 1982, Pacanowsky and O'Donell-Trujillo already suggested that organizational culture has to be studied not as an artifact but as process. "[when people] talk, write a play, sing, dance, fake illness, they are communicating; and they are constructing their culture." (Pacanowsky and O'Donell-Trujillo, 1982: 123) If communication at the workplace is a highly relevant motivational factor a common basis of cooperation has to be defined. Politeness, openness, or tolerance may be sustainable values that often will be shared. For this reason an access to new communication technologies or channels has to be given for non-computer related workplaces. Users' experience with new technologies in a sense of "learning by doing" can enhance acceptance for technological driven changes within companies. The elaboration of communication rules can be seen as a bargaining process. Therefore incentives to use new technologies have to be developed and provided. When a companywide use and a comparable perception of networked technologies is given, an integration with respect to the just mentioned values might be successful. Or with the words of Herbert Simon: "The question to be asked of any administrative process is: How does it influence the decisions of the individual? Without communication, the answer must always be: It does not influence them at all." (Simon, 1956: 109)

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